Schempp-Hirth Flugzeugbau GmbH
Krebenstraße 25 · Postfach 1443
D-7312 Kirchheim unter Teck

Provisional
FLIGHT MANUAL
for the powered sailplane
model "NIMBUS-3 T"

Issue: February 1985

This manual must be carried
on board at all times.

It refers to the powered sailplane

Model : Nimbus-3T

Registration No.: N74SL

Serial Number : 20

Manufacturer : Schempp-Hirth
Flugzeugbau GmbH
Krebenstraße 25 - Postfach 1443
D-7312 Kirchheim unter Teck

Owner : Kennon Stuart Shea
P.O. Box "O"
Quincy
California 95971
U.S.A.

This provisional Flight Manual for the powered sailplane model "Nimbus-3 T" supplements the Flight Manual for the sailplane model "Nimbus-3/24.5" and should be observed whenever the sailplane is being operated with the engine installed.

The following pages therefore replace the original pages printed for the pure sailplane version:

Page	No. 9	(edition May 1984)	
"	No. 10	(edition February 1984)	
"	No. 12	"	"
"	No. 14	"	"
"	No. 17	"	"
"	No. 18	"	"
"	No. 19	"	"
"	No. 20	"	"
"	No. 21	"	"
"	No. 23	"	"
"	No. 23a	"	"
"	No. 24	"	"
"	No. 25	"	"

The following pages are supplements to the basic Flight Manual for the "Nimbus-3/24.5" and describe additional placards, engine control box and engine operation:

Page 9A (edition February 1985)
Page 13 A (edition February 1985)
Page 13 B (edition February 1985)
Page 13 C (edition February 1985)
Page 13 D (edition February 1984)
Page 13 E (edition February 1984)
Page 13 F (edition February 1984)
Page 25 A (edition February 1984)

(13) Trim

Green ball-shaped knob on left side of seat mould support, mounted to the flap actuating rod.

The spring loaded trim is gradually adjusted by moving the knob slightly inwards, sliding it into the desired position and moving it outwards to lock.

Forward position – nose heahy

Rearward position – tail heavy

A neutral position of the trim at flap setting "0" is shown at the recess by means of a green marking.

(14) Parachute rip cord attachment

Red ring on the front left side of the main fuselage steel tube framework.

Pneumatic Valve (not shown on the picture)

Panel mounted two-way cock when a T.E. Compensator is used.

When flying power on, variometer reading is more steady when switched to static pressure.

STATIC = Static pressure sources connected

T.E. = T.E. Compensator connected

Master Switch (not shown on the picture)

Panel mounted toggle switch.

UP = ON

DOWN = OFF

De-compression handle (not pictured)

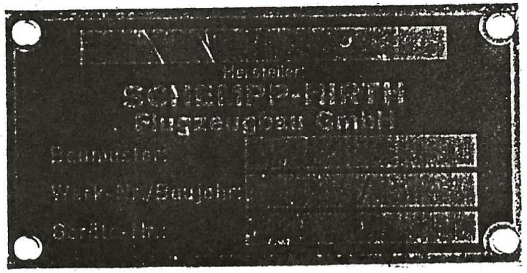
Black handle – on the left hand side of the instrument panel

The de-compression valves are opened when the handle is pulled back.

By releasing the handle the de-compression valves are closed by means of pressure springs.

Cockpit Data- and Reference Placards

Identification plate (fire proof)



Operating Limits

Maximum A.U. Weight: 750 kg / 1653 lb

Max. permitted speeds (IAS):	km/h	mph	kt
Engine retracted			
Flap settings -1, -2, S	270	168	146
Flap settings L, +2, +1, 0	160	99	86
in rough air	190	118	102
Maneuvering speed	190	118	102
Aerotow	180	112	97
Winch launch	150	93	81
for lowering U/C	180	112	97
Engine extended	160	99	86

Weak links for towing:

Maximum 910 daN (2006 lb)

Main wheel tire pressure:

5.0 bar (71 psi)

Placard near water ballast operating knob for inboard wing panel tanks

ALWAYS DUMP WATER BALLAST FROM
INBOARD WING PANELS FIRST

Placard near water ballast filler hole on inboard wing panels

ALWAYS FILL WATER BALLAST IN
OUTBOARD WING PANELS FIRST

Placard on outer rib of outboard wing panels

LOCKING PIN FLUSH
WITH UPPER SURFACE

CHECK LIST

EXTENDING AND STARTING THE POWER PLANT

- EXTEND POWER PLANT AT 85–95 km/h (46–51 kt, 53–59 mph)
- OPEN FUEL SHUT-OFF VALVE
- REMOVE AIR FROM FUEL LINE BY PUMPING
- IGNITION "O N"
- PULL DE-COMPRESSION HANDLE AND HOLD
- ACCELERATE TO 110–120 km/h (59–65 kt, 68–75 mph)
- RELEASE DE-COMPRESSION HANDLE WITH THE POWER PLANT RUNNING
- CLIMB AT 85–95 km/h (46–51 kt, 53–59 mph)
- FLAP SETTING +2

STOPPING AND RETRACTING THE POWER PLANT

- REDUCE SPEED TO 85–95 km/h (46–51 kt, 53–59 mph)
- CLOSE FUEL SHUT-OFF VALVE
- IGNITION "OFF"
- SLOW DOWN FURTHER UNTIL PROP HAS STOPPED
- RETRACT POWER PLANT AT 85–95 km/h (46–51 kt, 53–59 mph)

AUTOMOBILE PREMIUM GASOLINE, MIN. 96 ROZ,
GASOLINE/OIL MIXING PROPORTION:
1 : 30
FOR CASTROL SUPER TT TWO STROKE OIL

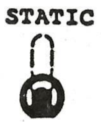
TANK	U.S. Gal.	Imp. Gal.	Ltr.
CAPACITY :	4.75	3.96	18.0
USABLE :	4.62	3.85	17.5

CAUTION WHEN REMOVING THE FUEL TANK:

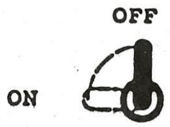
In order to prevent that fuel escapes through the vent hole, always connect the looped blind plug to the tank vent.

PNEUMATIC VALVE:

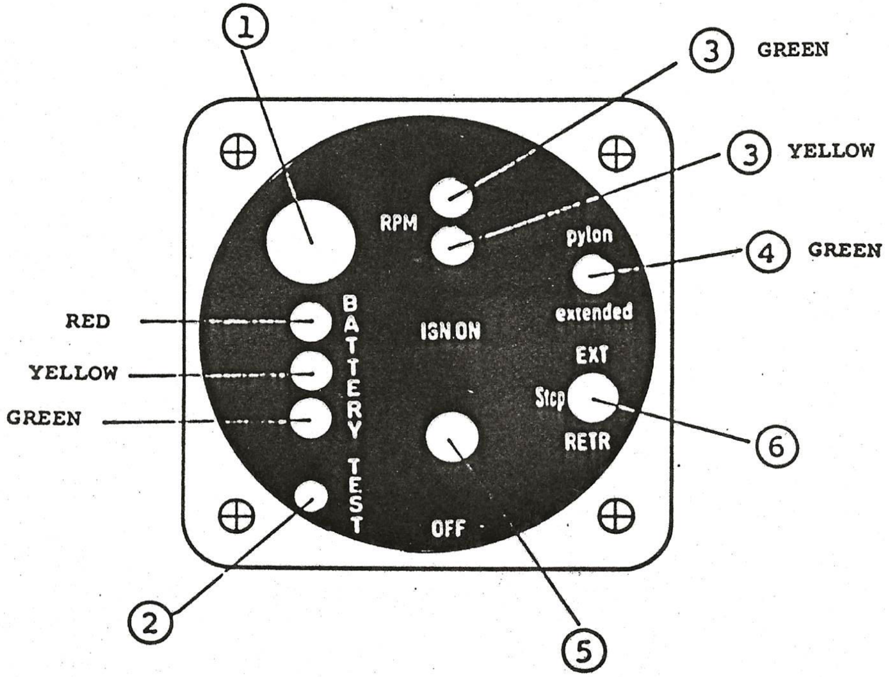
Static pressure/
T.E. Compensator



FUEL COCK



Panel-mounted Engine Control Box



① Automatic circuit breaker for pylon pivot drive.

In order to avoid a low current drain it is recommended to pull out the button of the circuit breaker after flying.

② Battery test button

Green signal – Voltage is 11.5 V or more

Yellow signal – Voltage is between 11.5 V and 10.5 V

Red signal – Voltage is below 10.5 V

For safety reasons a flashing red signal appears automatically, i.e. independent of the test button, if voltage drops below 10.5 V.

③ RPM indicator:

No signal = Engine stopped or running below 4000 RPM

Green signal = between 4000 and 5500 RPM (normal operating range)

Yellow signal = above 5500 RPM

④ Pylon position indicator

GREEN signal = Power plant fully extended

⑤ Ignition switch

UP = ON

DOWN = OFF

⑥ Pylon drive switch

: Switch has three (3) positions:

UP = Power plant extends fully, pylon drive is switched off by a micro limit switch

MIDDLE = Pylon drive stops

DOWN = Power plant retracts while switch is held down. In fully retracted position pylon drive is switched off by a micro limit switch.

NOTE : With the ignition "ON" the power plant may be extended - but it can't be retracted.

1.5 Operations with fuel tank and power plant being removed

Fuel tank and power plant are quickly removed from the Nimbus 3T.

Thereafter the Nimbus 3T shows the characteristics and the behaviour of the sailplane "Nimbus-3/24.5".

Therefore the operating limits marked

> "with fuel tank and power plant being removed"

do apply.

By removing fuel tank and power plant (engine and propeller) the empty weight is reduced by 21.0 kg (46.3 lb), but only a share of 19.0 kg/41.9 lb (for engine and propeller) influences the C.G. position.

Lever arm of engine and propeller:

965 mm (37.99 in.) aft of datum (BE).

Hence it follows that the tailskid load ΔG_2 is reduced by 3.4 kg (7.50 lb).

The "nose heavy" tendency, resulting from the removal of fuel tank, engine and propeller, can be reduced by taking out equipment from the fuselage nose being easily removable (battery or ballast weights, if installed).

Lever arm to the fuselage nose (battery, ballast weights)

1700 mm (66.93 in.) ahead of datum (BE)

By removing 1.0 kg (2.2 lb) from the fuselage nose the tailskid load ΔG_2 increases by 0.35 kg (0.77 lb).

With the values shown on page 13 e the new empty weight C.G. position is determined (see Maintenance Manual) and a revised loading table is established.

The results are to be entered into the weight- and balance log sheet on page 25 A, provided especially for operations with fuel tank and power plant being removed.

It is recommended that then the following table is attached in the cockpit:

Operations with fuel tank and power plant being removed:

Load on pilot's seat (pilot and parachute)

Maximum load	110 kg / 242.5 lb *
Minimum load	70 kg / 154.3 lb *

Pilot's weight of less than 70 kg/154.3 lb must be raised by using trim ballast.

* any deviations thereof are to be entered into the log sheet on page 25 A.

The Nimbus-3T may now be operated in accordance with NfL II-81/76 with an Attachment "C" to the Private Pilot License.

2. Operating limitations

2.1 Airspeed limits (IAS)

Airspeed limits (IAS)		km/h	mph	kt
Max. permitted speed Flaps set -1, -2, S	V_{NE}	270	168	146
Max. permitted speed Flaps set L,+2, +1, 0	V_{FE}	160	99	86
Max. permitted speed in rough air	V_{RA}	190	118	102
Maneuvering speed	V_A	190	118	102
Max. permitted speed on aerotow	V_T	180	112	97
Max. permitted speed on winch launch	V_W	150	93	81
Max. permitted speed for lowering U/C	V_{LO}	180	112	97
Max. permitted speed Engine extended	V_{NE}	160	99	86

Please note that with increasing altitude true airspeed (TAS) increases versus indicated airspeed (IAS).
This is of no consequence with regard to the stressing of the sailplane, however, for flutter prevention the following speeds (IAS) should not be exceeded:

Altitude (ft)	IAS mph	IAS kt	Altitude (ft)	IAS mph	IAS kt
0	168	146	20000	146	127
3300	168	146	23000	138	120
6500	168	146	26000	131	114
10000	168	146	29500	122	106
13000	163	142	33000	116	101
16500	155	134	39500	100	87

2.3 Load factors

The following maneuvering load factors must not be exceeded:

at V_A = 190 km/h, 118 mph, 102 knots

$n = + 5.3$

$n = - 2.65$

at V_{NE}= 270 km/h, 168 mph, 146 knots

$n = + 4.0$

$n = - 1.5$

airbrakes closed.

With airbrakes extended max.

$n = + 3.5$

2.4 Weights

	span 22.9 m	span 24.5 m
Empty weight approx.	970 lb 440 kg	979 lb 444 kg
Max. permitted take-off weight	1653 lb 750 kg	1653 lb 750 kg
Max. weight of non-lift carrying parts	661 lb 300 kg	661 lb 300 kg

For max. permitted water ballast see section 2.5.

2.5 Loading table

Seat load (pilot and parachute)

Minimum 70 kg (154.3 lb)
Maximum 110 kg (242.5 lb)

Note: The actual minimum or maximum seat load of this powered sailplane to which this manual applies may differ from the above typical weights, therefore please refer to the log chart, page 25.

At less weight a compensation with ballast is required.

Weight difference to minimum cockpit load: Ballast (lead- or sand cushion) must be securely held in place by attaching it to the lap belt brackets.

Neither the max. permitted take-off weight nor the maximum weight of the non-lift carrying parts (N.T.) may be exceeded.

C/G position of pilot

(with parachute or back cushion)

596 mm (23.5 in.) ahead of datum (BE)

Lever arm of fuel in fuselage tank

270 mm (10.63 in.) aft of datum (BE)
(= max. forward C.G.)

Loading table with water ballast

Maximum permitted take-off weight with water ballast for both wing spans ...... 750 kg/1653 lb

Lever arm of water ballast:

196 mm (7.7 in.) aft of datum (BE).

Note that for strength reasons it is not possible to use the full capacity of the inner wing panel tanks, therefore the sequence of filling and dumping the water ballast is strictly prescribed.

Always fill both tanks of the outboard wing panels first!

Capacity: 2 x 84 kg = 168 kg / 370 lb

Only thereafter the inboard tanks may be filled.

The total quantity of water ballast permitted is the amount that makes-up the maximum permitted take-off weight of 750 kg (1653 lb) which is identical for both wing spans.

Example:

Empty weight	440 kg	970 lb
Seat load	80 kg	176 lb
Fuel in fuselage tank	13 kg	29 lb
Water ballast in both outboard wing panels	168 kg	370 lb
	701 kg	1545 lb
Water ballast in both inboard wing panels	49 kg	108 lb
Max. permitted A.U.W. ..	750 kg	1653 lb

Always dump water ballast from inboard wing panel tanks first!

Table of various water ballast loads and cockpit loads:

Empty weight		Cockpit loads kg/lb									
kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
		70	154	80	176	90	198	100	220	110	242
430	948	250	551	240	529	230	507	220	485	210	463
440	970	240	529	230	507	220	485	210	463	200	441
450	992	230	507	220	485	210	463	200	441	190	419
460	1014	220	485	210	463	200	441	190	419	180	397
		Water ballast kg/lb in all wing tanks									
Max. permitted take-off weight 750 kg/1653 lb											

Note:

When determining the maximum permitted water ballast load, deduct the weight of the fuel.

The determination of the C.G. ranges as shown in the diagram on page 24 is done with the following cockpit loads:

Forward C.G. positions : With a maximum seat load of 110 kg (242.5 lb) and max. permitted water ballast

Rearward C.G. positions : With various minimum seat loads

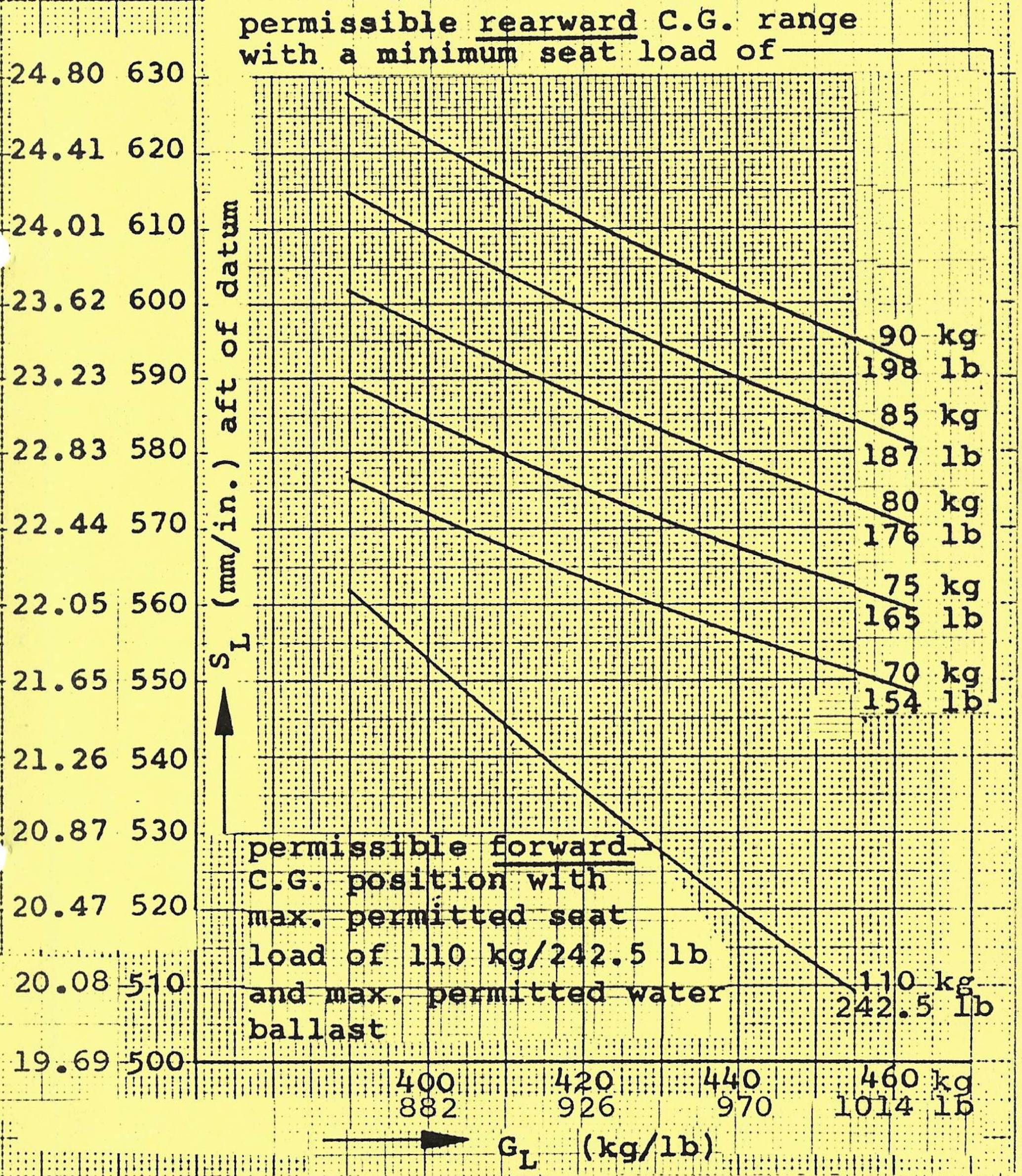
For easier determination of the "empty" weight C.G. position the table on page 23 a shows at various empty weights the maximum permissible tail skid loads with various seat loads (with reference to the rearmost C.G. position).

Just determine the actual tail skid load with the sailplane being in the weighing attitude with 22.9 m wing span.

If the determined tail skid load is below the value shown on page 23 a, the C.G. position is within the permissible range.

Empty weight kg	Empty weight lb	Tail skid load with a seat load of: 70 kg	154 lb	75 kg	165 lb	80 kg	176 lb	85 kg	187 lb	90 kg	198 lb
380	838	39.0	86.0	40.0	88.2	41.0	90.4	42.0	92.6	43.0	94.8
390	860	39.7	87.5	40.7	89.7	41.7	91.9	42.6	93.9	43.6	96.1
400	882	40.3	88.8	41.3	91.1	42.3	93.3	43.3	95.5	44.3	97.7
410	904	41.0	90.4	42.0	92.6	43.0	94.8	44.0	97.0	45.0	99.2
420	926	41.7	91.9	42.7	94.1	43.7	96.3	44.6	98.3	45.6	100.5
430	948	42.3	93.3	43.3	95.5	44.3	97.7	45.3	99.9	46.3	102.1
440	970	43.0	94.8	44.0	97.0	45.0	99.2	46.0	101.4	47.0	103.6
450	992	43.7	96.3	44.7	98.5	45.7	100.7	46.6	102.7	47.6	104.9

Empty weight C.G. Range



Maximum A.U.W. G_{max} = 750 kg/1653 lb

WEIGHT- and BALANCE LOG SHEET

(fuel tank and power plant being installed)

S/N 20, N74SL

Date of Weighing		03.05.1985				
Inspector Signature Stamp		Ausweis-Nr. 2450				
Empty weight (without usable fuel) kg		22.9 m: 450.0 * 24.5 m: 453.0 *				
Equipment List dated		03.05.1985				
Empty weight C.G. pos. aft of datum (BE) mm		22.9 m: 594.8 24.5 m: 593.6				
Pilot and parachute (kg)	max.*	104.0				
	min.	90.0				
Max. Payload incl. fuel in fuselage tank (kg)		117.5				
Max. Water ballast at	22.9 m	182.5				
max. Pay-load (kg)	24.5 m	179.5				

* incl. the manufacturer's 5.5 kg instrument panel

* Max. permitted weight of pilot and parachute = Max. Payload less fuel in fuselage tank, but not more than 110 kg (242.5 lb).

WEIGHT- and BALANCE LOG SHEET

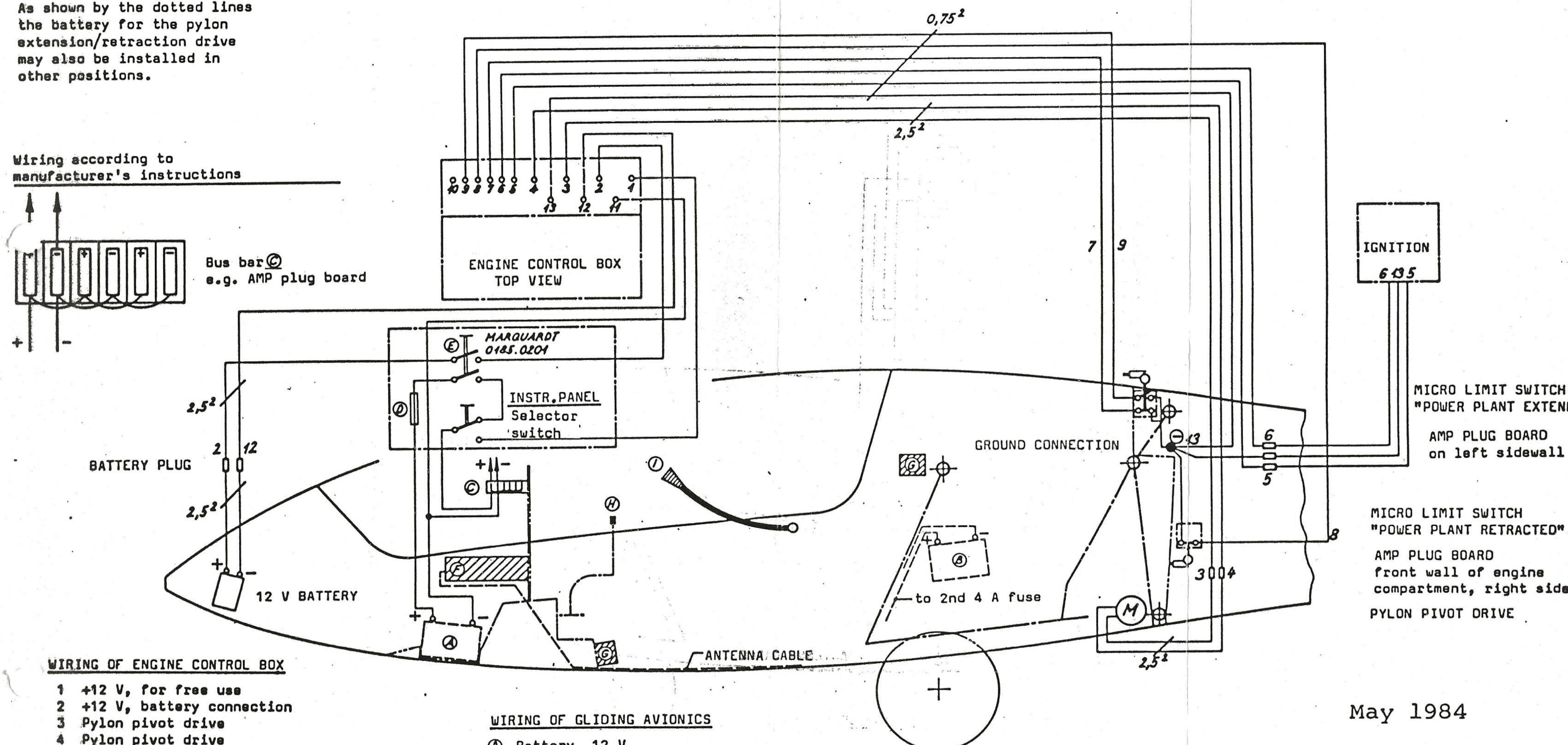
(fuel tank and power plant being removed)

Date of Weighing						
Inspector Signature Stamp						
Empty weight (kg)						
Equipment List dated						
Empty weight C.G. pos. aft of datum (mm)						
Pilot and parachute (kg)	max.*					
	min.					
Maximum Payload (kg)						
Maximum water ballast (kg) at max. payload	22.9 m					
	24.5 m					

* Maximum seat load (pilot & parachute) not exceeding 110 kg (242.5 lb).

HINWEIS:

As shown by the dotted lines the battery for the pylon extension/retraction drive may also be installed in other positions.



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WIRING OF ENGINE CONTROL BOX

1 +12 V, for free use
2 +12 V, battery connection
3 Pylon pivot drive
4 Pylon pivot drive
5 Ignition, Cylinder I
6 Ignition, Cylinder II
7 Micro limit switch "Power plant extended"
8 Micro limit switch "Power plant retracted"
9 "Green" signal circuit "Power plant extended"
10 Optional - RPM Indicator - 1 V = 1000 RPM
11 Ground (lower side of connection board), for free use
12 Ground (lower side of connection board)
13 Ground (lower side of connection board)

WIRING OF GLIDING AVIONICS

Ⓐ Battery, 12 V
Ⓑ Optional 2nd battery, wiring via 2nd 4A fuse and selector switch
Ⓒ Bus bar
Ⓓ 4 A fuse
Ⓔ Master switch
Ⓕ Transceiver
Ⓖ Speaker (location by choice)
Ⓗ PTT button
Ⓘ Microphone

Note: Wiring of the transceiver and other additional equipment only in accordance with the manufacturers instructions

Teil	Stück	Benennung	Abmessung	Werkstoff (Norm)	Anmerkung (Zei

L-825

Maßstab

Schempp-Hi
Flugzeugbau Gm
7312 Kirchheim-Te

1984	Tag	Name
gez	10. 05.	Meluk
gepr		

Baumuster
Nimbus-3 T

Wiring Diagram
and
Position View

Zeichn Nr
HM3-10.28